

amendment is believed to have been filed. Thus, Applicant's respectfully request full consideration of the arguments and remarks previously submitted, as below, at this time. Applicant may also file further comments, as necessary, in due course.

Paragraph 3 of the Official Action rejects claims 47, 48 and 53-58 as anticipated by JP 07-038113 to Morosawa. The Applicants respectfully traverse the rejection because the Official Action has not established an anticipation rejection.

As stated in MPEP § 2131, to establish an anticipation rejection, each and every element as set forth in the claim must be described either expressly or inherently in a single prior art reference. Verdegaal Bros. v. Union Oil Co. of California, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

The Applicants respectfully submit that an anticipation rejection cannot be maintained against the independent claims of the present application. Morosawa does not teach all the elements of the independent claims, either explicitly or inherently. The independent claims recite leveling a surface of a semiconductor film by heating after removing a natural oxidation film or an oxide film or after treatment with a hydrofluoric acid. Specifically, independent claims 1 and 47 recite leveling the surface of the semiconductor film by heating after removing said natural oxidation film; independent claims 2 and 5 recite leveling the surface of the semiconductor film by heating in a reducing atmosphere after removing said oxide film; independent claims 3 and 6 recite leveling the surface of the semiconductor film by heating in an inert gas after removing said oxide film; independent claims 4 and 19 recite leveling the surface of the semiconductor film by heating in an atmosphere after removing said oxide film; and independent claims 7-12, 20 and 48 recite leveling the surface of the semiconductor film by heating after the treatment with said hydrofluoric acid.

The Official Action broadly asserts that Morosawa teaches, for example with respect to claim 47, "leveling the surface of the semiconductor film by heating in inert gas (i.e., nitrogen gas) or in reducing atmosphere (i.e., in hydrogen) after the treatment

with the hydrofluoric acid" (page 3, Paper No. 20041210). The Official Action makes similar assertions in the Response to Arguments beginning on page 34.

As noted during the interview, the machine generated translation of Morosawa of record states, in relevant part:

[0010] Next, if it heat-treats at the temperature of about 500 degrees C in nitrogen-gas-atmosphere mind in order to stabilize the membranous quality of the polish recon thin film 6, as shown in drawing 4(A), the natural oxidation film 8 will be formed in the front face of the polish recon thin film 6. Next, it etches by dipping in fluoric acid a grade for 1 minute 1%. Then, the natural oxidation film 8 is removed by several second about room, and about 100A of surface layers of the polish recon thin film 6 is removed after this. This condition is shown in drawing 4(B). Thus, since about 100A of surface layers of the polish recon thin film 6 is removed, the impurity 7 which focused on the surface layer of the polish recon thin film 6, and remains will also be removed by coincidence. In addition, in order to stabilize the membranous quality of the polish recon thin film 6, you may heat-treat at the temperature of about 500-600 degrees C not in nitrogen-gas-atmosphere mind but in an oxygen ambient atmosphere. In this case, since etching time can be shortened rather than the case of heat treatment in nitrogen-gas-atmosphere mind, the damage given to a glass substrate 1 can be lessened. Moreover, etching may be dry etching. (Emphasis added)

During the interview it was asserted that the emphasized portion of Morosawa was being relied upon to teach a second heat treatment occurring after the removal of the natural oxide film. However, as stressed during the interview, it is respectfully submitted that this portion of Morosawa does not disclose or suggest a second heat treatment step, but rather discloses an alternative to the heat treatment previously disclosed in the first sentence of paragraph [0010]. It is noted that this paragraph is replete with obvious translational errors and during the interview the following, more accurate translation of this portion was presented:

[0010] Next, heat treatment is conducted at approximately 500 °C in a nitrogen gas atmosphere in order to stabilize the membranous quality of the poly-silicon thin film 6. Then, as shown in FIG. 4A, a natural oxidation film 8 is formed on a surface of the poly-silicon thin film 6. Next, etching is performed by dipping in 1% of fluoric acid for approximately 1 minute.

Then, the natural oxidation film 8 is removed in several seconds, and approximately 100 angstrom of surface layer of the poly-silicon thin film 6 is removed after this. This condition is shown in FIG. 4B. Thus, since approximately 100 angstrom of a surface layer of the poly-silicon thin film 6 is removed, the impurity 7 which is concentrated and remains at the surface layer of the poly-silicon thin film 6 is also removed at the same time. Furthermore, in order to stabilize the membranous quality of the poly-silicon thin film 6, the heat treatment may be conducted at a temperature of approximately 500 to 600 °C in an oxygen gas atmosphere instead of the nitrogen gas atmosphere. In this case, since etching time can be shorter than the case of heat treatment in the nitrogen gas atmosphere, a damage given to the glass substrate 1 can be lessened. Moreover, etching may be dry etching. (Emphasis added)

It is respectfully submitted that the underlined portion of the above translation can clearly only be properly interpreted to present an alternative to the first heat treatment step that occurs prior to the removal of the native oxide film. Both the underlined portion and the first sentence of the paragraph make reference to stabilizing the membranous quality of the film (i.e. both have the same intended purpose) and the emphasized portion makes clear that "the heat treatment may be conducted at a temperature of approximately 500 to 600 °C in an oxygen gas atmosphere instead of the nitrogen gas atmosphere." By referring to the use of an oxygen gas atmosphere for the heat treatment (i.e. the same, previously discussed heat treatment) instead of (i.e. as a replacement for) the nitrogen gas atmosphere, it is clear that the only fair interpretation of Morosawa is that this step is an alternative, or replacement, for the previously mentioned heat treatment step and not intended as a second, additional, heat treatment step.

It is further noted that the subsequent portions of paragraph 10 make reference to advantages achieved by the oxygen atmosphere heat treatment as compared to the nitrogen atmosphere heat treatment, which include shorter etching time. It is respectfully submitted that this further supports the proposition that this is a replacement for the earlier heat treatment step in that the statement immediately following the first disclosure of the nitrogen atmosphere heat treatment discusses that "etching is

performed by dipping in 1% of fluoric acid for approximately 1 minute. Then, the natural oxidation film 8 is removed in several seconds." Thus, by reference to the shorter etching time achieved using the oxygen atmosphere as compared to a nitrogen atmosphere, it is clear that this heat treatment in oxygen is intended to replace the earlier nitrogen gas heat treatment step.

Since Morosawa does not teach all the elements of the independent claims, either explicitly or inherently, an anticipation rejection cannot be maintained. Accordingly, reconsideration and withdrawal of the rejections under 35 U.S.C. § 102 are in order and respectfully requested.

Paragraph 5 of the Official Action rejects claims 19, 20, 23-30, 51 and 52 as obvious based on Morosawa. Paragraph 6 of the Official Action rejects claims 21, 22, 49 and 50 as obvious based on the combination of Morosawa and U.S. Patent No. 5,608,232 to Yamazaki et al. Paragraph 7 of the Official Action rejects claims 1-12 and 14-17 as obvious based on the combination of Morosawa and JP 09-186336 to Kudo et al. Paragraph 8 of the Official Action rejects claim 13 as obvious based on the combination of Morosawa, Kudo and Yamazaki. The Applicants respectfully traverse the rejection because the Official Action has not made a *prima facie* case of obviousness.

As stated in MPEP §§ 2142-2143.01, to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in

the art. "The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art." In re Kotzab, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000). See also In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); In re Jones, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

The prior art, either alone or in combination, does not teach or suggest leveling a surface of a semiconductor film by heating after removing a natural oxidation film or an oxide film or after treatment with a hydrofluoric acid. Morosawa, Kudo and Yamazaki, either alone or in combination, do not teach or suggest at least the above-referenced features of the present invention. As noted above, Morosawa fails to teach leveling a surface of a semiconductor film by heating after removing a natural oxidation film or an oxide film or after treatment with a hydrofluoric acid. Kudo and Yamazaki do not cure the deficiencies in Morosawa. Kudo is relied upon to allegedly teach irradiating an amorphous silicon film with an excimer laser in an atmosphere containing air (*i.e.* page 14, Paper No. 20040616) and Yamazaki is relied upon to allegedly teach furnace annealing (*i.e.* page 11, *Id.*). However, Morosawa, Kudo and Yamazaki, either alone or in combination, do not teach or suggest leveling a surface of a semiconductor film by heating after removing a natural oxidation film or an oxide film or after treatment with a hydrofluoric acid.

Since Morosawa, Kudo and Yamazaki do not teach or suggest all the claim limitations, a *prima facie* case of obviousness cannot be maintained. Accordingly, reconsideration and withdrawal of the rejections under 35 U.S.C. § 103(a) are in order and respectfully requested.

Should the Examiner believe that anything further would be desirable to place this application in better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,

  
Eric J. Robinson  
Reg. No. 38,285

Robinson Intellectual Property Law Office, P.C.  
PMB 955  
21010 Southbank Street  
Potomac Falls, Virginia 20165  
(571) 434-6789